

NOTIFICATION APPLIANCE CIRCUIT  
VOLTAGE DROP & POWER REQUIREMENTS

CKT AV2 – B31A			
DESCRIPTION	QTY	CURRENT PER ITEM (AMPS)	TOTAL CURRENT PER ITEM
WHEELLOCK STROBE 15 cd	–	0.5010	0.0000
WHEELLOCK HORN/STROBE 15cd	–	0.0000	0.0000
WHEELLOCK STROBE 30 cd	–	0.0300	0.0000
WHEELLOCK HORN/STROBE 30 cd	–	0.0450	0.0000
WHEELLOCK STROBE 75 cd	–	0.0210	0.0000
WHEELLOCK HORN/STROBE 75 cd	–	0.1100	0.0000
WHEELLOCK STROBE 110 cd	–	0.1100	0.0000
WHEELLOCK HORN/STROBE 110 cd	–	0.1750	0.0000
WHEELLOCK HORN	–	0.0000	0.0000
AUTOCALL BELL	1	0.0500	0.0500
TOTAL NOTIFICATION APPLIANCES CURRENT			0.0500

VOLTAGE DROP (VD) CALCULATIONS

VD = {(I) (D) (21.6)}/CM  
WHERE: I = CIRCUIT CURRENT  
D = CONDUCTOR LENGTH (FT) ONE WAY  
21.6 = A CONSTANT  
CM = CIRCULAR MILS  
VD = {(0.05A) (110FT) (21.64)}/4110 = 0.029V  
%VD = {0.029V / 24V} X 100 = 0.12%  
REMAINING VOLTS = 23.971

WIRE SIZE	CIRCULAR MILS
12AWG	6530
14AWG	4110
16AWG	2580
18AWG	1620
20AWG	1020

BATTERY CALCULATIONS  
FAP–001–31

ITEM	DESCRIPTION	QTY	STANDBY CURRENT PER ITEM (AMPS)	TOTAL STANDBY CURRENT PER ITEM	ALARM CURRENT PER ITEM (AMPS)	TOTAL ALARM CURRENT PER ITEM
CP–35	FACP w/2ZN'S + AUD	1	0.1750	0.1750	0.5010	0.5010
PS–35	POWER SUPPLY	1	0.0000	0.0000	0.0000	0.0000
BC–35	BATTERY CHARGER	1	0.0450	0.0450	0.0300	0.0300
SM–30	SWITCH MODULE	1	0.0000	0.0000	0.0450	0.0450
SR–30	2 RELAY MODULE	1	0.0000	0.0000	0.0450	0.0450
ZN–34US	SUPERVISORY MODULE	1	0.0100	0.0100	0.1100	0.1100
ZU–35	ZONE MODULE	3	0.0090	0.0270	0.1100	0.3300
ZU–35DS	ZONE MODULE/SD's	1	0.0090	0.0090	0.1100	0.1100
SMOKE	SMOKE DETECTOR	1	0.0001	0.0001	0.0010	0.0010
MOI	TRANSMITTER	1	0.1200	0.1200	0.1750	0.1750
MID	INPUT BOARD	1	0.0020	0.0020	0.0000	0.0000
PS–5A	POWER SUPPLY	1	0.0380	0.0380	0.0000	0.0000
TOTAL NOTIFICATION APPLIANCES CURRENT						0.2000
TOTAL SYSTEM CURRENT			STANDBY	0.4261	ALARM	1.6970

MIN. BATTERY CAPACITY = {(TOT. STANDBY CURRENT X STANDBY TIME) + (TOT. ALARM CURRENT X ALARM TIME)} X 1.25  
MIN. BATTERY CAPACITY = {(0.4261 A X 24 HR) + (1.6970 A X 0.083 HR)} X 1.25  
MIN. BATTERY CAPACITY = {10.2264 Ahr + 0.1409 Ahr} X 1.25 = 12.9591 Ahr

FIRE ALARM SYSTEM  
FUNCTION CHART

SYSTEM EVENT

	RESPONSE				
	ANNUNCIATE AT FACU	FIRE SIGNAL TO RECEIVER	TROUBLE SIGNAL TO LBNL RECEIVER	SUPERVISORY SIGNAL TO LBNL RECEIVER	OPERATE NOTIFICATION APPLIANCES
FIRE CALL BOX	●	●			●
SMOKE DETECTOR	●	●			
FIRE SPRINKLER WATERFLOW SWITCH	●	●			●
FIRE SPRINKLER VALVE SUPERVISORY SWITCH	●			●	
AC POWER FAILURE	●		●		
SYSTEM FAULT	●		●		

NOTIFICATION APPLIANCE CIRCUIT  
VOLTAGE DROP & POWER REQUIREMENTS

CKT AV1 – BLDG 31			
DESCRIPTION	QTY	CURRENT PER ITEM (AMPS)	TOTAL CURRENT PER ITEM
WHEELLOCK STROBE 15 cd	–	0.5010	0.0000
WHEELLOCK HORN/STROBE 15cd	–	0.0000	0.0000
WHEELLOCK STROBE 30 cd	–	0.0300	0.0000
WHEELLOCK HORN/STROBE 30 cd	–	0.0450	0.0000
WHEELLOCK STROBE 75 cd	–	0.0210	0.0000
WHEELLOCK HORN/STROBE 75 cd	–	0.1100	0.0000
WHEELLOCK STROBE 110 cd	–	0.1100	0.0000
WHEELLOCK HORN/STROBE 110 cd	–	0.1750	0.0000
WHEELLOCK HORN	–	0.0000	0.0000
AUTOCALL BELL	3	0.0500	0.1500
TOTAL NOTIFICATION APPLIANCES CURRENT			0.1500

VOLTAGE DROP (VD) CALCULATIONS

VD = {(I) (D) (21.6)}/CM  
WHERE: I = CIRCUIT CURRENT  
D = CONDUCTOR LENGTH (FT) ONE WAY  
21.6 = A CONSTANT  
CM = CIRCULAR MILS  
VD = {(0.15A) (100FT) (21.64)}/4110 = 0.084V  
%VD = {0.084V / 24V} X 100 = 0.348%  
REMAINING VOLTS = 23.916

WIRE SIZE	CIRCULAR MILS
12AWG	6530
14AWG	4110
16AWG	2580
18AWG	1620
20AWG	1020

NOTIFICATION APPLIANCE CIRCUIT CURRENTS

CKT AV1	BLDG 31	0.150
CKT AV2	B31A	0.050
CKT AV3	–	–
CKT AV4	–	–
CKT AV5	–	–
CKT AV6	–	–
CKT AV7	–	–
CKT AV8	–	–
	TOTAL NOTIFICATION APPLIANCES CURRENT	0.200

	AS BUILT — — — 09/16/13							BLDG 31 FIRE ALARM FUNCTION CHART & CALCULATIONS —	DRAWN BY LDD	DATE 09/16/2013
									CHECKED BY LDD	09/16/2013
									APPROVED BY MCD	09/16/2013
									SCALE AS NOTED	
									DRAWING NO. 4B31E017_	SHEET
PROFESSIONAL SEAL (IF REVISION, APPLIES ONLY TO REVISED WORK)	ISSUE (PROGRESS, ESTIMATE, BD, CONSTRUCTION, CONFORMED, REVISION, RECORD)	REVISION NUMBER	DRAWN BY	CHECKED BY	APPR'D BY	DATE	REMARKS	UNIVERSITY OF CALIFORNIA LAWRENCE BERKELEY NATIONAL LABORATORY FACILITIES DIVISION		
		—	LDD	LDD	MCD	09/16/13	AS BUILT	PROJECT NO. 000000		
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